

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: Lobel, Peter
Sleat, David E.
- (ii) TITLE OF INVENTION: NOVEL HUMAN LYSOSOMAL PROTEIN AND
METHODS OF ITS USE
- (iii) NUMBER OF SEQUENCES: 12
- (iv) CORRESPONDENCE ADDRESS:
 - (A) ADDRESSEE: David A. Jackson, Esq.
 - (B) STREET: 411 Hackensack Ave, Continental Plaza, 4th
Floor
 - (C) CITY: Hackensack
 - (D) STATE: New Jersey
 - (E) COUNTRY: USA
 - (F) ZIP: 07601
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: Floppy disk
 - (B) COMPUTER: IBM PC compatible
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: US
 - (B) FILING DATE:
 - (C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION:
 - (A) NAME: Jackson Esq., David A.
 - (B) REGISTRATION NUMBER: 26,742
 - (C) REFERENCE/DOCKET NUMBER: 601-1-077
- (ix) TELECOMMUNICATION INFORMATION:
 - (A) TELEPHONE: 201-487-5800
 - (B) TELEFAX: 201-343-1684

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 3487 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: cDNA
- (iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

CGCGGAAGGG CAGAATGGGA CTCCAAGCCT GCCTCCTAGG GCTCTTTGCC CTCATCCTCT	60
CTGGCAAATG CAGTTACAGC CCGGAGCCCG ACCAGCGGAG GACGCTGCCC CCAGGCTGGG	120

TGTCCCTGGG	CCGTGCGGAC	CCTGAGGAAG	AGCTGAGTCT	CACCTTTGCC	CTGAGACAGC	180
AGAATGTGGA	AAGACTCTCG	GAGCTGGTGC	AGGCTGTGTC	GGATCCCAGC	TCTCCTCAAT	240
ACGGAAAATA	CCTGACCCTA	GAGAATGTGG	CTGATCTGGT	GAGGCCATCC	CCACTGACCC	300
TCCACACGGT	GCAAAAATGG	CTCTTGGCAG	CCGGAGCCCA	GAAGTGCCAT	TCTGTGATCA	360
CACAGGACTT	TCTGACTTGC	TGGCTGAGCA	TCCGACAAGC	AGAGCTGCTG	CTCCCTGGGG	420
CTGAGTTTCA	TCACTATGTG	GGAGGACCTA	CGGAAACCCA	TGTTGTAAGG	TCCCCACATC	480
CCTACCAGCT	TCCACAGGCC	TTGGCCCCCC	ATGTGGACTT	TGTGGGGGGA	CTGCACCATT	540
TTCCCCAAC	ATCATCCCTG	AGGCAACGTC	CTGAGCCGCA	GGTGACAGGG	ACTGTAGGCC	600
TGCATCTGGG	GGTAACCCCC	TCTGTGATCC	GTAAGCGATA	CAACTTGACC	TCACAAGACG	660
TGGGCTCTGG	CACCAGCAAT	AACAGCCAAG	CCTGTGCCCA	GTTCTTGAG	CAGTATTTCC	720
ATGACTCAGA	CCTGGCTCAG	TTCATGCGCC	TCTTCGGTGG	CAACTTTGCA	CATCAGGCAT	780
CAGTAGCCCG	TGTGGTTGGA	CAACAGGGCC	GGGGCCGGGC	CGGGATTGAG	GCCAGTCTAG	840
ATGTGCAGTA	CCTGATGAGT	GCTGGTGCCA	ACATCTCCAC	CTGGGTCTAC	AGTAGCCCTG	900
GCCGGCATGA	GGGACAGGAG	CCCTTCCTGC	AGTGGCTCAT	GCTGCTCAGT	AATGAGTCAG	960
CCCTGCCACA	TGTGCATACT	GTGAGCTATG	GAGATGATGA	GGACTCCCTC	AGCAGCGCCT	1020
ACATCCAGCG	GGTCAACACT	GAGCTCATGA	AGGCTGCTGC	TCGGGGTCTC	ACCCTGCTCT	1080
TCGCCTCAGG	TGACAGTGGG	GCCGGGTGTT	GGTCTGTCTC	TGGAAGACAC	CAGTTCCGCC	1140
CTACCTTCCC	TGCCTCCAGC	CCCTATGTCA	CCACAGTGGG	AGGCACATCC	TTCCAGGAAC	1200
CTTTCCTCAT	CACAAATGAA	ATTGTTGACT	ATATCAGTGG	TGGTGGCTTC	AGCAATGTGT	1260
TCCCACGGCC	TTCATACCAG	GAGGAAGCTG	TAACGAAGTT	CCTGAGCTCT	AGCCCCCACC	1320
TGCCACCATC	CAGTTACTTC	AATGCCAGTG	GCCGTGCCTA	CCCAGATGTG	GCTGCACTTT	1380
CTGATGGCTA	CTGGGTGGTC	AGCAACAGAG	TGCCCATTCC	ATGGGTGTCC	GGAACCTCGG	1440
CCTCTACTCC	AGTGTTTGGG	GGGATCCTAT	CCTTGATCAA	TGAGCACAGG	ATCCTTAGTG	1500
GCCGCCCCCC	TCTTGGCTTT	CTCAACCCAA	GGCTCTACCA	GCAGCATGGG	GCAGGACTCT	1560
TTGATGTAAC	CCGTGGCTGC	CATGAGTCCT	GTCTGGATGA	AGAGGTAGAG	GGCCAGGGTT	1620
TCTGCTCTGG	TCCTGGCTGG	GATCCTGTAA	CAGGCTGGGG	AACACCCAAC	TTCCCAGCTT	1680
TGCTGAAGAC	TCTACTCAAC	CCCTGACCCT	TTCTATCAG	GAGAGATGGC	TTGTCCCCTG	1740
CCCTGAAGCT	GGCAGTTCAG	TCCCTTATTC	TGCCCTGTTG	GAAGCCCTGC	TGAACCCCTCA	1800
ACTATTGACT	GCTGCAGACA	GCTTATCTCC	CTAACCCCTGA	AATGCTGTGA	GCTTGACTTG	1860
ACTCCCAACC	CTACCATGCT	CCATCATACT	CAGGTCTCCC	TACTCCTGCC	TTAGATTCCCT	1920
CAATAAGATG	CTGTAAGTAG	CATTTTTTTGA	ATGCCTCTCC	CTCCGCATCT	CATCTTTCTC	1980

TTTTCAATCA GGCTTTTCCA AAGGGTTGTA TACAGACTCT GTGCACTATT TCACTTGATA	2040
TTCATTCCCC AATTCAC TGC AAGGAGACCT CTACTGTCAC CGTTTACTCT TTCCTACCCT	2100
GACATCCAGA AACAATGGCC TCCAGTGCAT ACTTCTCAAT CTTTGCTTTA TGGCCTTTCC	2160
ATCATAGTTG CCCACTCCCT CTCCTTACTT AGCTTCCAGG TCTTAACTTC TCTGACTACT	2220
CTTGTCTTCC TCTCTCATCA ATTTCTGCTT CTTTCATGGAA TGCTGACCTT CATTGCTCCA	2280
TTTGTAGATT TTTGCTCTTC TCAGTTTACT CATTGTCCCC TGGAACAAAT CACTGACATC	2340
TACAACCATT ACCATCTCAC TAAATAAGAC TTTCTATCCA ATAATGATTG ATACCTCAAA	2400
TGTAAGATGC GTGATACTCA ACATTTCATC GTCCACCTTC CCAACCCCAA ACAATTCCAT	2460
CTCGTTTCTT CTTGGTAAAT GATGCTATGC TTTTCCAAC CAAGCCAGAA ACCTGTGTCA	2520
TCTTTTCACC CCACCTTCAA TCAACAAGTC CTCAATCAAC AAGTCCTACT GACTGCACAT	2580
CTTAAATATA TCTTTATCAG TCCACAAGTC CTTCCAATTA TATTTCCCAA GTATATCTAG	2640
AACTTATCCA CTTATATCCC CACTGCTACT ACCTTAGTTT AGGGCTATAT TCTCTTGAAA	2700
AAAAGTGTC TTA CTTCCCTG CCAATCCCCA AGTCATCTTC CAGAGTAAAA TGCAAATCCC	2760
ATCAGGCCAC TTGGATGAAA ACCCTTCAAG GATTACTGGA TAGAATTCAG GCTTTCCCCT	2820
CCASCCCCCA ATCATAGCTC ACAAACCTTC CTTGCTATTT GTTCTTAAGT AAAAAATCAT	2880
TTTTCTCCT CCCTCCCCAA ACCCCAAGGA ACTCTCACTC TTGCTCAAGC TGTTCCGTCC	2940
CCTTACCACC CCTGATACAA CTGCCAGGTT AATTTCCAGA ATTCTTGCAA GACTCAGTTC	3000
AGAAGTCACC TTCTTTCGTG AATGTTTTGA TTCCCTGAGG CTACTTTATT TTGGTATGGC	3060
TGAAAAATCC TAGATTTTCT AAACAAAACC TGTTTGAATC TTGGTTCTGA TATGGACTAG	3120
GAGAGAGACT GGGTCAAGTA AGCTTATCTC CCTGAGGCTG TTTCTCGTC TGTAAAGTGT	3180
GAATATCAAT ACCTGCCTTT CATAATCACC AGGGAATAAA GTGGAATAAT GTTGATAACA	3240
GTGCTTGGCA CCTGGAAGTA GGTGGCAGAT GTTAACGCCC TTCCTCCCTT GCACTGCGCC	3300
CCCTGTGCCT ACCTCTAGCA TTGTAACGAC CACATAGTAT TGAAATGGCC AGTTTACTTG	3360
TCTGCCTTCC TTTCCAAGAC CGTTGGTGCC TAGAGGACTA GAATCGTGTC CTATTTAACT	3420
TTGTGTTCCC AGGTCCTAGC TCAGGAGTTG GCAAATAAGA ATTAAATGTC TGCTACACCG	3480
AAACAAA	3487

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 2520 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

CGCGGAAGGG CAGAATGGGA CTCCAAGCCT GCCTCCTAGG GCTCTTTGCC CTCATCCTCT	60
CTGGCAAATG CAGTTACAGC CCGGAGCCCG ACCAGCGGAG GACGCTGCCC CCAGGCTGGG	120
TGTCCCTGGG CCGTGCGGAC CCTGAGGAAG AGCTGAGTCT CACCTTTGCC CTGAGACAGC	180
AGAATGTGGA AAGACTCTCG GAGCTGGTGC AGGCTGTGTC GGATCCCAGC TCTCCTCAAT	240
ACGGAATAA CCTGACCCTA GAGAATGTGG CTGATCTGGT GAGGCCATCC CCACTGACCC	300
TCCACACGGT GCAAAAATGG CTCTTGGCAG CCGGAGCCCA GAAGTGCCAT TCTGTGATCA	360
CACAGGACTT TCTGACTTGC TGGCTGAGCA TCCGACAAGC AGAGCTGCTG CTCCCTGGGG	420
CTGAGTTTCA TCACTATGTG GGAGGACCTA CGGAAACCCA TGTTGTAAGG TCCCCACATC	480
CCTACCAGCT TCCACAGGCC TTGGCCCCC ATGTGGACTT TGTGGGGGGA CTGCACCATT	540
TTCCCCAAC ATCATCCCTG AGGCAACGTC CTGAGCCGCA GGTGACAGGG ACTGTAGGCC	600
TGCATCTGGG GGTAACCCCC TCTGTGATCC GTAAGCGATA CAACTTGACC TCACAAGACG	660
TGGGCTCTGG CACCAGCAAT AACAGCCAAG CCTGTGCCCA GTTCCTGGAG CAGTATTTCC	720
ATGACTCAGA CCTGGCTCAG TTCATGCGCC TCTTCGGTGG CAACTTTGCA CATCAGGCAT	780
CAGTAGCCCG TGTGGTTGGA CAACAGGGCC GGGGCCGGGC CGGGATTGAG GCCAGTCTAG	840
ATGTGCAGTA CCTGATGAGT GCTGGTGCCA ACATCTCCAC CTGGGTCTAC AGTAGCCCTG	900
GCCGGCATGA GGGACAGGAG CCCTTCCTGC AGTGGCTCAT GCTGCTCAGT AATGAGTCAG	960
CCCTGCCACA TGTGCATACT GTGAGCTATG GAGATGATGA GGA CTCCCTC AGCAGCGCCT	1020
ACATCCAGCG GGTCAACACT GAGCTCATGA AGGCTGCTGC TCGGGGTCTC ACCCTGCTCT	1080
TCGCCTCAGG TGACAGTGGG GCCGGGTGTT GGTCTGTCTC TGGAAAGACAC CAGTTCCGCC	1140
CTACCTTCCC TGCCTCCAGC CCCTATGTCA CCACAGTGGG AGGCACATCC TTCCAGGAAC	1200
CTTTCCTCAT CACAAATGAA ATTGTTGACT ATATCAGTGG TGGTGGCTTC AGCAATGTGT	1260
TCCCACGGCC TTCATAACCAG GAGGAAGCTG TAACGAAGTT CCTGAGCTCT AGCCCCACC	1320
TGCCACCATC CAGTTACTTC AATGCCAGTG GCCGTGCCTA CCCAGATGTG GCTGCACTTT	1380
CTGATGGCTA CTGGGTGGTC AGCAACAGAG TGCCCATTCC ATGGGTGTCC GGAACCTCGG	1440
CCTCTACTCC AGTGTTTGGG GGGATCCTAT CCTTGATCAA TGAGCACAGG ATCCTTAGTG	1500
GCCGCCCCC TCTTGGCTTT CTCAACCCAA GGCTCTACCA GCAGCATGGG GCAGGACTCT	1560
TTGATGTAAC CCGTGGCTGC CATGAGTCCT GTCTGGATGA AGAGGTAGAG GGCCAGGGTT	1620
TCTGCTCTGG TCCTGGCTGG GATCCTGTAA CAGGCTGGGG AACACCCAAC TTCCCAGCTT	1680
TGCTGAAGAC TCTACTCAAC CCCTGACCCT TTCCTATCAG GAGAGATGGC TTGTCCCCTG	1740

CCCTGAAGCT GGCAGTTCAG TCCCTTATTC TGCCCTGTTG GAAGCCCTGC TGAACCCTCA	1800
ACTATTGACT GCTGCAGACA GCTTATCTCC CTAACCCTGA AATGCTGTGA GCTTGACTTG	1860
ACTCCCAACC CTACCATGCT CCATCATACT CAGGTCTCCC TACTCCTGCC TTAGATTCCT	1920
CAATAAGATG CTGTAAC TAG CATT TTTTGA ATGCCTCTCC CTCCGCATCT CATCTTTCTC	1980
TTTTCAATCA GGCTTTTCCA AAGGGTTGTA TACAGACTCT GTGCACTATT TCACTTGATA	2040
TTCATTCCCC AATTCAC TGC AAGGAGACCT CTACTGTCAC CGTTTACTCT TTCCTACCT	2100
GACATCCAGA AACAATGGCC TCCAGTGCAT ACTTCTCAAT CTTTGCTTTA TGGCCTTTCC	2160
ATCATAGTTG CCCACTCCCT CTCCTTACTT AGCTTCCAGG TCTTAACTTC TCTGACTACT	2220
CTTGTCTTCC TCTCTCATCA ATTTCTGCTT CTTTCATGGAA TGCTGACCTT CATTGCTCCA	2280
TTTGTAGATT TTTGCTCTTC TCAGTTTACT CATTGTCCCC TGGAACAAAT CACTGACATC	2340
TACAACCATT ACCATCTCAC TAAATAAGAC TTTCTATCCA ATAATGATTG ATACCTCAAA	2400
TGTAAGATGC GTGATACTCA ACATTTTCATC GTCCACCTTC CCAACCCCAA ACAATTCCAT	2460
CTCGTTTCTT CTTGGTAAAT GATGCTATGC TTTTCCAAC CAAAAAAAAA AAAAAAAAAA	2520

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 563 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Met	Gly	Leu	Gln	Ala	Cys	Leu	Leu	Gly	Leu	Phe	Ala	Leu	Ile	Leu	Ser	1	5	10	15
Gly	Lys	Cys	Ser	Tyr	Ser	Pro	Glu	Pro	Asp	Gln	Arg	Arg	Thr	Leu	Pro	20	25	30	
Pro	Gly	Trp	Val	Ser	Leu	Gly	Arg	Ala	Asp	Pro	Glu	Glu	Glu	Leu	Ser	35	40	45	
Leu	Thr	Phe	Ala	Leu	Arg	Gln	Asn	Val	Glu	Arg	Leu	Ser	Glu	Leu	50	55	60		
Val	Gln	Ala	Val	Ser	Asp	Pro	Ser	Ser	Pro	Gln	Tyr	Gly	Lys	Tyr	Leu	65	70	75	80
Thr	Leu	Glu	Asn	Val	Ala	Asp	Leu	Val	Arg	Pro	Ser	Pro	Leu	Thr	Leu	85	90	95	

His Thr Val	Gln Lys Trp Leu Leu	Ala Ala Gly Ala Gln Lys Cys His
100	105	110
Ser Val Ile Thr Gln Asp Phe Leu Thr Cys Trp Leu Ser Ile Arg Gln		
115	120	125
Ala Glu Leu Leu Leu Pro Gly Ala Glu Phe His His Tyr Val Gly Gly		
130	135	140
Pro Thr Glu Thr His Val Val Arg Ser Pro His Pro Tyr Gln Leu Pro		
145	150	160
Gln Ala Leu Ala Pro His Val Asp Phe Val Gly Gly Leu His His Phe		
165	170	175
Pro Pro Thr Ser Ser Leu Arg Gln Arg Pro Glu Pro Gln Val Thr Gly		
180	185	190
Thr Val Gly Leu His Leu Gly Val Thr Pro Ser Val Ile Arg Lys Arg		
195	200	205
Tyr Asn Leu Thr Ser Gln Asp Val Gly Ser Gly Thr Ser Asn Asn Ser		
210	215	220
Gln Ala Cys Ala Gln Phe Leu Glu Gln Tyr Phe His Asp Ser Asp Leu		
225	230	235
Ala Gln Phe Met Arg Leu Phe Gly Gly Asn Phe Ala His Gln Ala Ser		
245	250	255
Val Ala Arg Val Val Gly Gln Gln Gly Arg Gly Arg Ala Gly Ile Glu		
260	265	270
Ala Ser Leu Asp Val Gln Tyr Leu Met Ser Ala Gly Ala Asn Ile Ser		
275	280	285
Thr Trp Val Tyr Ser Ser Pro Gly Arg His Glu Gly Gln Glu Pro Phe		
290	295	300
Leu Gln Trp Leu Met Leu Leu Ser Asn Glu Ser Ala Leu Pro His Val		
305	310	315
His Thr Val Ser Tyr Gly Asp Asp Glu Asp Ser Leu Ser Ser Ala Tyr		
325	330	335
Ile Gln Arg Val Asn Thr Glu Leu Met Lys Ala Ala Ala Arg Gly Leu		
340	345	350
Thr Leu Leu Phe Ala Ser Gly Asp Ser Gly Ala Gly Cys Trp Ser Val		
355	360	365
Ser Gly Arg His Gln Phe Arg Pro Thr Phe Pro Ala Ser Ser Pro Tyr		
370	375	380
Val Thr Thr Val Gly Gly Thr Ser Phe Gln Glu Pro Phe Leu Ile Thr		
385	390	395
Asn Glu Ile Val Asp Tyr Ile Ser Gly Gly Gly Phe Ser Asn Val Phe		
405	410	415
Pro Arg Pro Ser Tyr Gln Glu Glu Ala Val Thr Lys Phe Leu Ser Ser		
420	425	430

Ser Pro His Leu Pro Pro Ser Ser Tyr Phe Asn Ala Ser Gly Arg Ala
 435 440 445
 Tyr Pro Asp Val Ala Ala Leu Ser Asp Gly Tyr Trp Val Val Ser Asn
 450 455 460
 Arg Val Pro Ile Pro Trp Val Ser Gly Thr Ser Ala Ser Thr Pro Val
 465 470 475 480
 Phe Gly Gly Ile Leu Ser Leu Ile Asn Glu His Arg Ile Leu Ser Gly
 485 490 495
 Arg Pro Pro Leu Gly Phe Leu Asn Pro Arg Leu Tyr Gln Gln His Gly
 500 505 510
 Ala Gly Leu Phe Asp Val Thr Arg Gly Cys His Glu Ser Cys Leu Asp
 515 520 525
 Glu Glu Val Glu Gly Gln Gly Phe Cys Ser Gly Pro Gly Trp Asp Pro
 530 535 540
 Val Thr Gly Trp Gly Thr Pro Asn Phe Pro Ala Leu Leu Lys Thr Leu
 545 550 555 560
 Leu Asn Pro

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 587 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Met Lys Ser Ser Ala Ala Lys Gln Thr Val Leu Cys Leu Asn Arg Tyr
 1 5 10 15
 Ala Val Val Ala Leu Pro Leu Ala Ile Ala Ser Phe Ala Ala Phe Gly
 20 25 30
 Ala Ser Pro Ala Ser Thr Leu Trp Ala Pro Thr Asp Thr Lys Ala Phe
 35 40 45
 Val Thr Pro Ala Gln Val Glu Ala Arg Ser Ala Ala Pro Leu Leu Glu
 50 55 60
 Leu Ala Ala Gly Glu Thr Ala His Ile Val Val Ser Leu Lys Leu Arg
 65 70 75 80
 Asp Glu Ala Gln Leu Lys Gln Leu Ala Gln Ala Val Asn Gln Pro Gly
 85 90 95

Asn	Ala	Gln	Phe	Gly	Lys	Phe	Leu	Lys	Arg	Arg	Gln	Phe	Leu	Ser	Gln	
		100						105					110			
Phe	Ala	Pro	Thr	Glu	Ala	Gln	Val	Gln	Ala	Val	Val	Ala	His	Leu	Arg	
		115					120					125				
Lys	Asn	Gly	Phe	Val	Asn	Ile	His	Val	Val	Pro	Asn	Arg	Leu	Leu	Ile	
	130					135					140					
Ser	Ala	Asp	Gly	Ser	Ala	Gly	Ala	Val	Lys	Ala	Ala	Phe	Asn	Thr	Pro	
145					150					155					160	
Leu	Val	Arg	Tyr	Gln	Leu	Asn	Gly	Lys	Ala	Gly	Tyr	Ala	Asn	Thr	Ala	
				165					170						175	
Pro	Ala	Gln	Val	Pro	Gln	Asp	Leu	Gly	Glu	Ile	Val	Gly	Ser	Val	Leu	
		180						185					190			
Gly	Leu	Gln	Asn	Val	Thr	Arg	Ala	His	Pro	Met	Leu	Lys	Val	Gly	Glu	
	195						200					205				
Arg	Ser	Ala	Ala	Lys	Thr	Leu	Ala	Ala	Gly	Thr	Ala	Lys	Gly	His	Asn	
	210					215					220					
Pro	Thr	Glu	Phe	Pro	Thr	Ile	Tyr	Asp	Ala	Ser	Ser	Ala	Pro	Thr	Ala	
225					230					235					240	
Ala	Asn	Thr	Thr	Val	Gly	Ile	Ile	Thr	Ile	Gly	Gly	Val	Ser	Gln	Thr	
				245					250					255		
Leu	Gln	Asp	Leu	Gln	Gln	Phe	Thr	Ser	Ala	Asn	Gly	Leu	Ala	Ser	Val	
			260					265					270			
Asn	Thr	Gln	Thr	Ile	Gln	Thr	Gly	Ser	Ser	Asn	Gly	Asp	Tyr	Ser	Asp	
		275					280					285				
Asp	Gln	Gln	Gly	Gln	Gly	Glu	Trp	Asp	Leu	Asp	Ser	Gln	Ser	Ile	Val	
	290					295					300					
Gly	Ser	Ala	Gly	Gly	Ala	Val	Gln	Gln	Leu	Leu	Phe	Tyr	Met	Ala	Asp	
305					310					315					320	
Gln	Ser	Ala	Ser	Gly	Asn	Thr	Gly	Leu	Thr	Gln	Ala	Phe	Asn	Gln	Ala	
				325					330					335		
Val	Ser	Asp	Asn	Val	Ala	Lys	Val	Ile	Asn	Val	Ser	Leu	Gly	Trp	Cys	
			340					345					350			
Glu	Ala	Asp	Ala	Asn	Ala	Asp	Gly	Thr	Leu	Gln	Ala	Glu	Asp	Arg	Ile	
		355					360					365				
Phe	Ala	Thr	Ala	Ala	Ala	Gln	Gly	Gln	Thr	Phe	Ser	Val	Ser	Ser	Gly	
		370				375					380					
Asp	Glu	Gly	Val	Tyr	Glu	Cys	Asn	Asn	Arg	Gly	Tyr	Pro	Asp	Gly	Ser	
385					390					395					400	
Thr	Tyr	Ser	Val	Ser	Trp	Pro	Ala	Ser	Ser	Pro	Asn	Val	Ile	Ala	Val	
				405					410					415		
Gly	Gly	Thr	Thr	Leu	Tyr	Thr	Thr	Ser	Ala	Gly	Ala	Tyr	Ser	Asn	Glu	
			420					425					430			

Thr Val Trp Asn Glu Gly Leu Asp Ser Asn Gly Lys Leu Trp Ala Thr
 435 440 445
 Gly Gly Gly Tyr Ser Val Tyr Glu Ser Lys Pro Ser Trp Gln Ser Val
 450 455 460
 Val Ser Gly Thr Pro Gly Arg Arg Leu Leu Pro Asp Ile Ser Phe Asp
 465 470 475 480
 Ala Ala Gln Gly Thr Gly Ala Leu Ile Tyr Asn Tyr Gly Gln Leu Gln
 485 490 495
 Gln Ile Gly Gly Thr Ser Leu Ala Ser Pro Ile Phe Val Gly Leu Trp
 500 505 510
 Ala Arg Leu Gln Ser Ala Asn Ser Asn Ser Leu Gly Phe Pro Ala Ala
 515 520 525
 Ser Phe Tyr Ser Ala Ile Ser Ser Thr Pro Ser Leu Val His Asp Val
 530 535 540
 Lys Ser Gly Asn Asn Gly Tyr Gly Gly Tyr Gly Tyr Asn Ala Gly Thr
 545 550 555 560
 Gly Trp Asp Tyr Pro Thr Gly Trp Gly Ser Leu Asp Ile Ala Lys Leu
 565 570 575
 Ser Ala Tyr Ile Arg Ser Asn Gly Phe Gly His
 580 585

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 635 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein
- (iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Met Lys Ile Glu Lys Thr Ala Leu Thr Val Ala Ile Ala Leu Ala Met
 1 5 10 15
 Ser Ser Leu Ser Ala His Ala Glu Asp Ala Trp Val Ser Thr His Thr
 20 25 30
 Gln Ala Ala Met Ser Pro Pro Ala Ser Thr Gln Val Leu Ala Ala Ser
 35 40 45
 Ser Thr Ser Ala Thr Thr Thr Gly Asn Ala Tyr Thr Leu Asn Met Thr
 50 55 60
 Gly Ser Pro Arg Ile Asp Gly Ala Ala Val Thr Ala Leu Glu Ala Asp
 65 70 75 80
 His Pro Leu His Val Glu Val Ala Leu Lys Leu Arg Asn Pro Asp Ala

85								90					95				
Leu	Gln	Thr	Phe	Leu	Ala	Gly	Val	Thr	Thr	Pro	Gly	Ser	Ala	Leu	Phe		
100								105				110					
Gly	Lys	Phe	Leu	Thr	Pro	Ser	Gln	Phe	Thr	Glu	Arg	Phe	Gly	Pro	Thr		
115								120				125					
Gln	Ser	Gln	Val	Asp	Ala	Val	Val	Ala	His	Leu	Gln	Gln	Ala	Gly	Phe		
130								135				140					
Thr	Asn	Ile	Glu	Val	Ala	Pro	Asn	Arg	Leu	Leu	Ile	Ser	Ala	Asp	Gly		
145				150								155					
Thr	Ala	Gly	Ala	Ala	Thr	Asn	Gly	Phe	Arg	Thr	Ser	Ile	Lys	Arg	Phe		
				165				170				175					
Ser	Ala	Asn	Gly	Arg	Glu	Phe	Phe	Ala	Asn	Asp	Ala	Pro	Ala	Leu	Val		
				180				185				190					
Pro	Ala	Ser	Leu	Gly	Asp	Ser	Val	Asn	Ala	Val	Leu	Gly	Leu	Gln	Asn		
195								200				205					
Val	Ser	Val	Lys	His	Thr	Leu	His	His	Val	Tyr	His	Pro	Glu	Asp	Val		
210								215				220					
Thr	Val	Pro	Gly	Pro	Asn	Val	Gly	Thr	Gln	Ala	Ala	Ala	Ala	Val	Ala		
225				230								235					
Ala	His	His	Pro	Gln	Asp	Phe	Ala	Ala	Ile	Tyr	Gly	Gly	Ser	Ser	Leu		
				245				250				255					
Pro	Ala	Ala	Thr	Asn	Thr	Ala	Val	Gly	Ile	Ile	Thr	Trp	Gly	Ser	Ile		
				260				265				270					
Thr	Gln	Thr	Val	Thr	Asp	Leu	Asn	Ser	Phe	Thr	Ser	Gly	Ala	Gly	Leu		
275								280				285					
Ala	Thr	Val	Asn	Ser	Thr	Ile	Thr	Lys	Val	Gly	Ser	Gly	Thr	Phe	Ala		
290								295				300					
Asn	Asp	Pro	Asp	Ser	Asn	Gly	Glu	Trp	Ser	Leu	Asp	Ser	Gln	Asp	Ile		
305				310								315					
Val	Gly	Ile	Ala	Gly	Gly	Val	Lys	Gln	Leu	Ile	Phe	Tyr	Thr	Ser	Ala		
				325				330				335					
Asn	Gly	Asp	Ser	Ser	Ser	Ser	Gly	Ile	Thr	Asp	Ala	Gly	Ile	Thr	Ala		
				340				345				350					
Ser	Tyr	Asn	Arg	Ala	Val	Thr	Asp	Asn	Ile	Ala	Lys	Leu	Ile	Asn	Val		
355								360				365					
Ser	Leu	Gly	Glu	Asp	Glu	Thr	Ala	Ala	Gln	Gln	Ser	Gly	Thr	Gln	Ala		
370				375								380					
Ala	Asp	Asp	Ala	Ile	Phe	Gln	Gln	Ala	Val	Ala	Gln	Gly	Gln	Thr	Phe		
385				390				395				400					
Ser	Ile	Ala	Ser	Gly	Asp	Ala	Gly	Val	Tyr	Gln	Trp	Ser	Thr	Asp	Pro		
				405				410				415					
Thr	Ser	Gly	Ser	Pro	Gly	Tyr	Val	Ala	Asn	Ser	Ala	Gly	Thr	Val	Lys		

420					425					430						
Ile	Asp	Leu	Thr	His	Tyr	Ser	Val	Ser	Glu	Pro	Ala	Ser	Ser	Pro	Tyr	
435					440					445						
Val	Ile	Gln	Val	Gly	Gly	Thr	Thr	Leu	Ser	Thr	Ser	Gly	Thr	Thr	Trp	
450					455					460						
Ser	Gly	Glu	Thr	Val	Trp	Asn	Glu	Gly	Leu	Ser	Ala	Ile	Ala	Pro	Ser	
465					470					475					480	
Gln	Gly	Asp	Asn	Asn	Gln	Arg	Leu	Trp	Ala	Thr	Gly	Gly	Gly	Val	Ser	
485					490					495						
Leu	Tyr	Glu	Ala	Ala	Pro	Ser	Trp	Gln	Ser	Ser	Val	Ser	Ser	Ser	Thr	
500					505					510						
Lys	Arg	Val	Gly	Pro	Asp	Leu	Ala	Phe	Asp	Ala	Ala	Ser	Ser	Ser	Gly	
515					520					525						
Ala	Leu	Ile	Val	Val	Asn	Gly	Ser	Thr	Glu	Gln	Val	Gly	Gly	Thr	Ser	
530					535					540						
Leu	Ala	Ser	Pro	Leu	Phe	Val	Gly	Ala	Phe	Ala	Arg	Ile	Glu	Ser	Ala	
545					550					555					560	
Ala	Asn	Asn	Ala	Ile	Gly	Phe	Pro	Ala	Ser	Lys	Phe	Tyr	Gln	Ala	Phe	
565					570					575						
Pro	Thr	Gln	Thr	Ser	Leu	Leu	His	Asp	Val	Thr	Ser	Gly	Asn	Asn	Gly	
580					585					590						
Tyr	Gln	Ser	His	Gly	Tyr	Thr	Ala	Ala	Thr	Gly	Phe	Asp	Glu	Ala	Thr	
595					600					605						
Gly	Phe	Gly	Ser	Phe	Asp	Ile	Gly	Lys	Leu	Asn	Thr	Tyr	Ala	Gln	Ala	
610					615					620						
Asn	Trp	Val	Thr	Gly	Gly	Gly	Gly	Gly	Ser	Thr						
625					630					635						

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "Oligonucleotides"
- (iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

GTGATCACAG AATGGCACTT

20

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "Oligonucleotides"
- (iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

AACATGGGTT TCCGTAGGTC

20

(2) INFORMATION FOR SEQ ID NO:8:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "Oligonucleotides"
- (iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

CTTCCTCAGG GTCCGCACGG

20

(2) INFORMATION FOR SEQ ID NO:9:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 38 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "Oligonucleotides"
- (iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

TGTAAAACGA CGGCCAGTCA GACCTTCCAG TAGGGACC

38

(2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 38 base pairs
 - (B) TYPE: nucleic acid

(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "Oligonucleotides"

(iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

CAGGAAACAG CTATGACCCT GTATCCCACA CAAGAGAT

38

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "Oligonucleotides"

(iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

TGTAAACGA CGGCCAGTTA GATGCCATTG GGGACTGG

38

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "Oligonucleotides"

(iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

CAGGAAACAG CTATGACCGT CATGGAAATA CTGCTCCA

38